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SCIENCE NEWS LETTER

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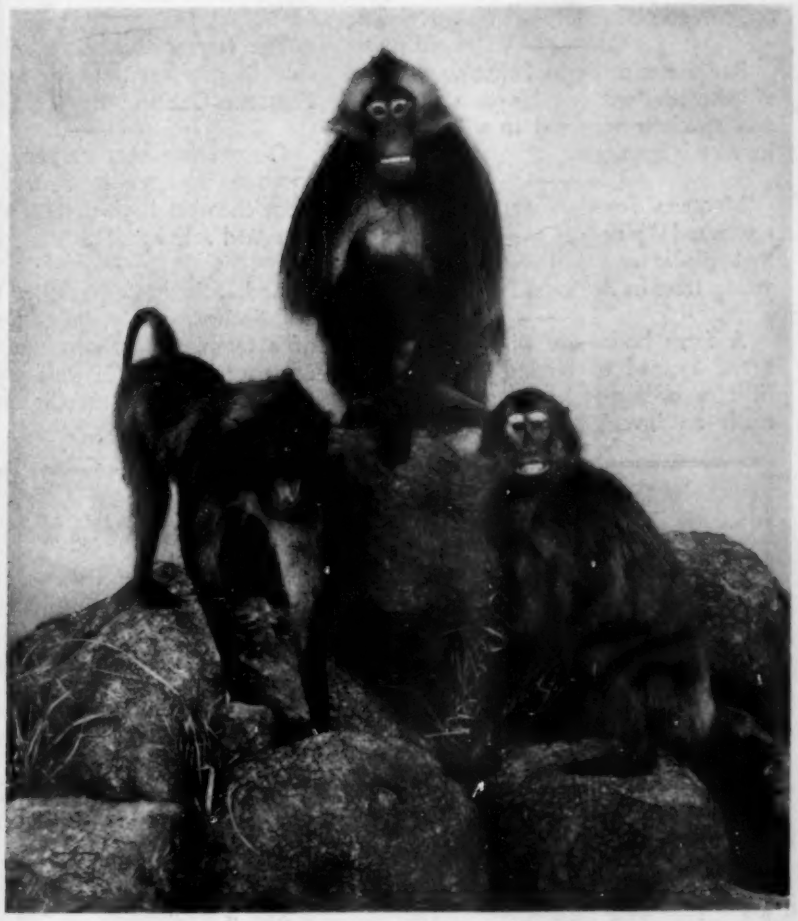
THE WEEKLY SUMMARY OF CURRENT SCIENCE•



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Rare Apes From Ethiopia

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Edited by WATSON DAVIS

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DO YOU KNOW?

The first concrete pavement in the United States was laid in Bellefontaine, Ohio, 43 years ago and is still in service.

A meteorologist who has a hobby of collecting distinctive names for winds, throughout the world, has a list of about 500.

A gold nugget recently found in the Soviet Union weighed over 26 pounds and was said to resemble a long flat boulder.

Archers are permitted to hunt game with bows and arrows in a wild game reserve in the Malheur National Forest, Oregon.

Radio sets made in Palestine are provided with wood cabinets extra-dried and specially veneered to withstand the heat and humidity.

Montana foresters are attacking an unwanted "pine" crop—the porcupines that girdle and kill vast numbers of young trees in National Forests.

A farm housewife who makes white bread instead of buying it saves very little, according to home economists who made an investigation in Vermont.

In Canada it is unlawful to advertise a "cure" for obesity.

Taking sweat baths was a custom among many Indian tribes.

About two-thirds of the United States' wealth comes from minerals.

Seeking new uses for French resinous products, France is trying resin as a road surfacing material.

The United States has had about 800,000 miners working underground, in normal industrial times.

The largest ships now afloat will be able to pass easily under the new San Francisco-Oakland Bay bridge.

Discovering that an enzyme causes spoilage in eggs in storage, Government chemists have developed a process to retard activity of this enzyme.

Archaeologists digging at the Forum of Minturnae, Italy, found burned ruins of a temple and shops, and coins dating up to 191 B.C., thus verifying the statement by Livy that lightning struck the Forum in that year.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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PUBLIC HEALTH

How is trench mouth spread? p. 100.

RADIO

Is a portable radio transmitter satisfactory for practical use? p. 103.

PHYSICS

New Theory of Relativity Announced by Yale Scientist

Einstein's Famous Theory Broadened to Make It Applicable to Happenings Within the Atom

A NEW theory of relativity, presented as a more effective mathematical tool than the famous Einstein theory, is offered to the world of science by Prof. Leigh Page, widely-known theoretical physicist of Yale University. The new theory is expected to be useful in interpreting the atom. It will have no effect on large scale happenings.

While Prof. Page does not say so, the effect of changing the relativity theory may be likened to proposals for changing the Supreme Court, for relativity has been pictured as the supreme court of science before which all physical laws and theories must be judged.

Prof. Page states in his report (*Physical Review* Feb. 1.):

"The author believes that Einstein's postulate is too restricted to include all possible motions of material particles. In this paper the author will present an alternative theory, and will give reasons for believing that it, rather than Einstein's theory, represents the proper formulation of relativity in an effectively empty world."

Prof. Page broadens Einstein's relativity theory by proving the following result:

"It is shown," he says, in summarizing his work, "that in an effectively empty world Einstein's assumption of an invariant physical interval and an absolute four-dimensional space-time is in contradiction with the underlying principle of the relativity of motion, and therefore either the one or the other must be abandoned."

Basic "Planks"

Which is saying in effect that either one or the other of the two basic "planks," on which the entire structure of Einstein's relativity theory is built, is fundamentally unsound.

As a very broad theory of science which has permeated nearly all fields of physical research, the relativity theory has more than a rough analogy to the Supreme Court of the United States.

As Prof. W. F. G. Swann has explained regarding the value of Einstein's relativity theory to science:

"The theory of relativity serves as a sort of supreme court to which we may present our proposed theories, our proposed laws of nature, for validation. The theory of relativity cannot, in general, discover the laws for us, but it can act as a useful guide in helping us to our choice."

Prof. Swann points out further the basic conclusion of relativity theory that, in no way, is it possible to detect absolute motion in space. If a theory of science on atoms, gravitation or anything else indicates that such an experiment should be possible, either relativity theory is wrong or the proposed theory is wrong. In this sense the relativity theory is a supreme court where the laws of nature are put to test. While it does not suggest new laws, any more than the Supreme Court of the nation does, the relativity theory, like the Supreme Court, serves as a hurdle which all physical laws must surmount to be accepted into the realm of science.

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RUSSIAN ROCKET

Shown above is the Soviet rocket which, it is reported, has reached a height of more than 19,000 feet in experimental flights. Engineer A. I. Polyarny, who directs the research, is shown with the device. Time for the ascent was one minute and the descent was by parachute. A meteorograph attached to the rocket recorded both temperature and air pressure. From the latter the maximum altitude was calculated.

PHYSICS

New Relativity Theory is Explained By the Author

By PROF. LEIGH PAGE,
Yale University

THE "New Relativity," described in the February 1 issue of the *Physical Review*, broadens rather than controverts Einstein's theory. It was suggested by the point of view presented by E. A. Milne of Oxford in his recent book "Relativity, Gravitation and World-Structure," in which the author dispenses with the undefinable concepts of rigid measuring rods and periodic clocks and bases his theory on the concept of light-signals traveling with constant velocity. In its present state of development the new theory is an extension of the special theory promulgated by Einstein in 1905, rather than a modification of his general theory of 1915. Hence its applications are to microscopic rather than to cosmic phenomena.

The inertial systems of Einstein's special theory constitute a group of reference frames each of which has a Euclidean geometry and a constant light-velocity. These reference frames have constant velocities relative to one another. The significant discovery reported in the "New Relativity" is the existence of other reference frames characterized by Euclidean geometries and constant light-velocities, which are accelerated relative to one another. If, then, there are no preferred reference systems in an effectively empty region, the laws of nature must be the same relative to the newly discovered reference frames as they are relative to the inertial systems considered in Einstein's theory. In this way the theory leads to the possibility of types of motion not allowed by the older theories, and offers the hope of acquiring a better understanding of the motions occurring in the atom.

Science News Letter, February 15, 1936

PUBLIC HEALTH

Trench Mouth Threatens To Be Always With Us

TRENCH mouth, which plagued the doughboys in France, threatens to become one of the diseases that are always with us, or as scientists say, endemic in this country, Dr. Don Chalmers Lyons of Jackson, Mich., declared at the meeting of the Society of Bacteriologists, Pathologists and Allied Workers of Michigan, Ohio and Indiana.

Carriers, that is, persons who have trench mouth without knowing it, and improperly cleaned beverage glasses are the means by which this disease is spreading, Dr. Lyons stated. He quoted impressive figures to show the increase in cases of this disease within recent years.

"In the state of Washington, where it is classed as a common communicable disease and according to law reportable within 24 hours to county and city health officers, there were 7 cases reported in 1931 and 343 in 1934; a tremendous increase from a percentage standpoint," Dr. Lyons said. "Ninety-five cases were reported in Illinois in 1931 and 758 in 1934, or a 700 per cent. increase. Eight hundred and eighty cases were reported in up-state New York in 1931 and 1,733 in 1934, or more than a hundred per cent. increase. One can safely say that if all cases were reported the figures would be even more impressive."

Dr. Lyons and other scientists have examined glasses as they came back from customers in beverage dispensing establishments and also as they hung on the rack, supposedly clean and ready for use. They found many of the "germs" of trench mouth on the rims of both dirty and clean glasses. Reporting this investigation, Dr. Lyons said that one's chance of getting trench mouth with a glass of beer were one in five.

The chronic stage of the disease is the most important from the public health standpoint, Dr. Lyons said. The organisms or "germs" that cause it are apparently not normally found in the mouth but they may get into the gums and propagate there without causing much discomfort to the patient. The latter does not realize he has the disease, does not have it treated, and unsuspectingly passes on the organisms to susceptible persons, who may then suffer from the acute stage of the disease.

Dr. Lyons gave three measures for checking the spread of trench mouth. These are:

"1. More rigid enforcement of sanitary standards in beverage dispensing establishments.

"2. Better control of Vincent's infection (the scientific name for trench mouth).

"3. Education of the public to demand proper sanitary measures to protect their health."

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PHYSICS

New Theory Holds Light To be Electric Rings of Force

A NEW theory explaining the long-baffling problem of the apparent dual nature of light which sometimes acts like a particle and at others like a wave motion has just been reported by Sir Joseph Thomson. (*Nature*, Feb. 8.)

Elderly Sir Joseph, who is known the world over as J. J. Thomson, was elected Fellow of the Royal Society as far back as 1884 and is now head master of Trinity College, Cambridge University. He was awarded the Nobel Prize in physics in 1906.

A photon of light, according to the distinguished scientist, might well be regarded as a ring of electric force travelling at right angles to its plane. It would be like a ring slipping along a cane; the cane serving as the light ray. Sir Joseph now extends this picture of light to consider a photon of light as a series, or train, of such rings.

A quantum of light, he suggests further, would be a train of definite length of these electric rings of force that would be given out by an electron in falling between energy levels in an atom. A train of rings, Sir Joseph indicates, would make possible an explanation of the interference of light.

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MEDICINE

Congenital Syphilis Can be Prevented, Specialists Find

CONGENITAL syphilis is practically a preventable disease.

So announced Dr. Harold N. Cole of Cleveland and seven other medical specialists who, under the name of the Cooperative Clinical Group, have studied the pooled records of five large syphilis clinics in the United States to determine the outcome of pregnancy in women treated for syphilis. (*Journal, American Medical Association*, Feb. 8.)

The prevention of congenital syphilis is dependent upon the routine, early and repeated use of the serologic blood test on every expectant mother and on adequate early treatment once the diagnosis of syphilis is made.

The study reported has been conducted through the cooperation of syphilis clinics of Western Reserve University, the Johns Hopkins University, Mayo Clinic, University of Pennsylvania and University of Michigan, assisted by the U. S. Public Health Service and supported by a special fund contributed by an anonymous donor and a grant by the Milbank Memorial fund. Those signing the report with Dr. Cole of Cleveland are Lida J. Usilton, Washington, D. C.; Dr. Joseph Earle Moore, Baltimore; Dr. Paul A. O'Leary, Rochester, Minn.; Dr. John H. Stokes, Philadelphia; Dr. Udo J. Wile, Ann Arbor, Mich.; Dr. Thomas Parran, Jr., Albany, N. Y., and Dr. R. A. Vonderlehr, Washington, D C.

Among their findings were the following:

1. A positive blood test for syphilis in the mother is a serious matter to the unborn child. Ten times as many syphilitic children were born when the syphilitic mother's blood was positive during pregnancy as when it was negative.

2. The pregnant syphilitic woman was found to tolerate anti-syphilitic treatment as well or better than the syphilitic woman who had not been pregnant since infection.

3. There is evidence that syphilitic

women who habitually abort are capable of producing living, apparently non-syphilitic children when given specific treatment through each pregnancy.

4. Many more non-syphilitic living children were born when anti-syphilitic treatment was begun before the fifth month of pregnancy than when treatment was delayed.

5. If an early syphilis appears late in pregnancy, some treatment begun at this period and continued until termination of the pregnancy, even though it is only a small amount, will be of value in the production of a living child.

6. Treatment during a preceding pregnancy is insufficient protection for the present pregnancy, even though the syphilitic woman has a negative blood reaction. It is necessary to treat her throughout each pregnancy in order to insure a living non-syphilitic infant.

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WILD LIFE

Are Duck, Bobwhite, Deer On Way to Extinction?

Conference Hears That Even Cottontail Rabbit Is Becoming So Scarce That Replacement Is Needed

EXTINCTION'S shadow hovers hawk-like over America's remaining wildlife. Will mallard and bobwhite, deer and beaver, vanish as passenger pigeon, great auk, and heath hen have vanished?

No, was the emphatic answer given at the first session of field biologists and conservationists, gathered for the first North American Wildlife Conference, held in Washington. Several score of wildlife scientists and wildlife administrators spoke their minds on special problems, in papers presented at sectional sessions.

It might be thought that the prolific cottontail rabbit would be about the last animal to cause conservationists worry by diminishing numbers, yet such is not the case. Although in some states the value of the cottontails shot annually is greater than that of all other game put together, the supply is running low enough, in some localities, to necessitate the spending of thousands of dollars a year for breeding and replacements of these animals, Dr. R. E. Trippensee, professor of wildlife management at Massachusetts State College, informed the meeting.

Wildlife conservation and replenishment is not entirely a matter for Federal and State agencies, spending millions of dollars upon thousands of square miles of land. Every farmer can run his own conservation program, and many thousands of them are already doing it, on a really scientific basis. Sparing brushy timber patches on creek bottoms and upland, encouraging shrubs and low trees where gullies need to be checked, planting patches of such game feeding crops as milo maize and leaving them for the birds to harvest, are some of the background elements of such farm-wildlife projects. Game thus encouraged becomes a paying crop in the end, under several different cooperative schemes in force in various states.

L. G. MacNamara told how it is worked in New Jersey, Aldo Leopold explained the Wisconsin system, F. B. O'Connell spoke of conditions in Nebraska, from the neighbor state of Iowa came Logan Bennett, and A. L. Clark related developments in Connecticut.

Yellow corn, though not a native plant, seems to be the best thing for bobwhite quail under winter conditions in the West, Prof. Paul L. Errington of Iowa State College told his colleagues. Some weed seeds they eat freely and digest, he said, but such things as sumac fruits and wild-rose hips, often thought of as natural quail food, they resort to only when real starvation threatens. These cut their hunger deaths by about fifty per cent.; but there is little real nutriment in them for the birds.

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GENERAL SCIENCE

"Circus of Science" Will Tour the Country

A CARAVAN of 28 motor trucks containing exhibits of science in industry is going on tour throughout the country, Alfred P. Sloan, Jr., president of General Motors Corporation, has announced.

Frankly using the idea behind the Chicago Century of Progress, the "circus of science" will bring to leading

SCIENCE JOINS THE CIRCUS

Robert Audet, theatre manager, uses the arts of the stage to bring home the facts of science to the audience attending the "show" of General Motors Parade of Progress.

cities throughout the nation the latest developments and feats of applied science. A great silver-topped tent will serve as an exhibit hall and supply the circus atmosphere.

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PHYSIOLOGY

Brain Waves Used in Tracing Activity of Brain Centers

Clue to Areas of Brain Deterioration in Those With Mental Disease May be Given by Variation in Waves

THE CHIEF regions of rhythmic activity in the brain can now be located roughly through science's latest researches upon brain waves, the electrical currents that originate in the human brain. Drs. H. H. Jasper and H. L. Andres, of Brown University's psychology department and the Emma Pendleton Bradley Home at Providence, R. I., have also used brain waves as pointers to defective and deteriorated parts of the brain not functioning as they should.

Not any closer to "reading minds" by brain waves, nevertheless science seems likely to use the new knowledge gained in understanding thought processes and in studying mental diseases.

The brain waves are not uniform throughout the whole brain, the investigators report. (*Journal of General Psychology*, January.) Two distinct types of brain waves, known to scientists as alpha waves and beta waves, have been studied. The alpha waves seem to predominate in the lower back part of the head, although under certain conditions some individuals show mostly beta waves in this region. The alpha waves are affected differently by light stimulation than are the beta waves.

In the normal person, alpha waves on the right side of the head are alike in frequency and amplitude to those in a similar region of the left side, although they may be somewhat out of phase, one lagging behind the other. This similarity is absent in a mental patient having one side of the brain diseased. Pictures of the electric waves led off the two sides of the brain of sufferers from brain injury, for example, following lead poisoning, showed a great difference between the activity on the two sides of the brain.

Brain waves of the other type, known as beta waves, are faster than the alpha waves. In any individual they have about twice the frequency and half the amplitude of that person's alpha waves. They are more predominant in the area at the top of the head known as the Rolandic region. This is the part of the brain governing movement of the body. Occasionally outbursts of alpha waves are also found in this home of the beta waves.

In epileptic patients, the brain wave records during a seizure show what some scientists have likened to a "neurological thunder storm." Drs. Jasper and Andres have confirmed the finding that even when the patient is not undergoing a seizure, his susceptibility to them is betrayed by his brain wave record.

Sporadic seizure waves localized in the motor region of the brain, for example, when no seizure is present produce a similar pattern on the record paper to that seen in all parts of the brain during a generalized convulsion. The method of localized recording described by these authors permits the following of these seizure waves as they spread from one region of the brain to another.

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ARCHAEOLOGY

Find Tools Believed Left In America During Ice Age

STRONG evidence tending to show that man existed in North America before the end of the Ice Age is announced by Prof. Paul MacClintock, of the Princeton University Geology Department. The evidence is reported to be human implements found in the White River region of South Dakota and Nebraska and deposited there before the time of the last glacial advance.

In the field with Prof. A. L. Lugn of the University of Nebraska and assisted by Justus S. Templeton, a Princeton senior from Dixon, Illinois, Prof. MacClintock discovered last summer varved sediments in the bed of an extinct lake formed when the valley of the White River was dammed by the last advance of the ice sheet. If these sediments are contemporaneous with the ice sheet, they figured that man-made artifacts found in or below the lake sediments would prove that man was there before the ice.

Accordingly, C. B. Schultz and his party from the Nebraska State Museum, under E. H. Barbour, dug below the sediments and found not only many artifacts, but scores of hearth-pits containing charcoal, burned stones, and burned bones of extinct animals. The pits, which are two or three feet wide and one or two feet deep, seem to have been used to preserve the fire from day to day. The artifacts are of the Yuma type.

While the evidence thus far uncovered is not absolutely conclusive, it is believed that another season will either prove or definitely disprove the hypothesis that man appeared on this continent before the end of the Ice Age. Older theories have leaned strongly to the belief that man did not arrive in North America until the last glaciers had melted sufficiently to allow a crossing from Asia.

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ARCHAEOLOGY

Cretan Images Confirm Truth of Ancient Writings

PEASANTS' discovery of a ruined building near Dreros has led archaeologists to unearth a remarkable temple, believed to be the oldest Greek temple in Crete.

The temple dates from the eighth century B.C., when Crete's own brilliant civilization had faded, and the Greeks were rising to be leaders of culture.

Outstanding among the temple's contents are bronze statues of two goddesses and a naked child god. These religious images were made by hammering thin plates of bronze to shape, possibly around a wooden core, and fastening the bronze in place with pins. Ancient Greek writers described such a process, but never before have archaeologists found actual statues thus hammered. Greek sculptures known today were made by casting.

The temple, measuring 30 by 20 feet, contains a square hearth still covered with ashes, and a stone base on which a wooden column once stood.

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Butterflies are reported increasingly scarce in British forests.

RADIO

Tiny Radio Transmitter Sends Voice Four Miles

DEVELOPMENT of the world's smallest micro-wave transmitter for use in broadcast circuits has been announced by O. B. Hanson, chief engineer of the National Broadcasting Company.

Distances up to four miles were attained by the midget "radio station," which can be held in the palm of the hand, in exhaustive tests recently made of the first working model completed by NBC's research laboratory.

The new device is not intended for broadcasts direct to listeners' radio sets, but for actual program service at any point of origin, to extend the scope of pick-up for present radio networks.

The new micro-wave unit, Hanson reveals, is the result of a two-year search for a "coat-pocket transmitter" to enable foot-loose announcers to carry a microphone to any desired point, or circulate at will among large assemblages, for purposes of broadcasting or to feed a public address system from the floor.

"Investigations in the micro-wave field," Mr. Hanson explained, "suggested that work in this band of 300,000,000 cycles and more would permit the midget antenna equipment necessary for the compactness we sought. Micro-waves also offered a phenomenal degree of penetration through intervening structures, so the tiny waves were employed in developing the new portable transmitter."

The new micro-wave transmitter proves the possibility of a practical "coat-pocket" size unit, and further laboratory work is now in progress to rush completion of the still smaller-size design.

In its present stage, the micro-wave set is a three-inch cube, with two ten-inch rods as antennae to release the tiny radio waves. It transmits at a power of two-tenths of a watt, employing the latest type of tiny "acorn" tube developed by RCA.

Current is fed to the midget set by an extremely small battery unit of 90 volts, also newly-developed in cooperation with NBC. The complete battery unit weighs less than four pounds, and the transmitter proper, less than a pound.

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TINY TRANSMITTER

This midget set, fitting in the hand of O. B. Hanson, chief engineer of the National Broadcasting Company, will send the voice for a distance of four miles. It is designed as a traveling transmitter to pick up programs from unusual places. With it are shown the special pocket-size batteries and the tiny "acorn tube" used in the set.

ARCHAEOLOGY

Rare St. Paul Epistles Of Bible Being Deciphered

DIVIDED between them, Britain and America now possess a large portion of the Epistles of Saint Paul from one of the rarest Bibles in the world.

Announcement was made in London by Sir Frederick Kenyon, noted Biblical authority, that he has been editing fifty-six Egyptian leaves of the Chester Beatty Biblical Papyrus acquired by A. Chester Beatty, American millionaire, now a British subject.

The 56 leaves in England, and 30 more that belong to the University of Michigan, constitute almost completely the letters of Saint Paul from Romans, fifth chapter, to the First Epistle to the Thessalonians, Sir Frederick announced.

The text is in Greek, easy to decipher, he said, except where the edges of the leaves are damaged. The ink is probably of vegetable origin, and the writing is in a fine hand. It dates from the third century.

Portions of this extremely old and rare Bible have been coming to light as Arab dealers offer them for sale.

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PALEONTOLOGY

Tiny Motor-Driven Chisel Helps Clean Up Fossils

ATOM-THUMB edition of the noisy pavement-breaking chisel is aiding British museum workers to clear valuable fossil bones of their encrusting stony matrix, with a fraction of the tedious labor formerly required. The whole apparatus is about four times the size of a fountain pen, and is motor driven. A small emery wheel on the other end of the motor shaft makes resharpening of the chisel blades easy.

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MEDICINE

Scent in Lipstick Causes Skin Trouble in Sensitive

CHANGE the scent of your lipstick, girls, if the kind you are using brings on a skin trouble.

The doctors have traced some cases of lipstick dermatitis—the skin disorder that occasionally develops among users of a lip rouge—to the perfume it contains.

A particular offender is a perfume containing methyl heptine carbonate, The Journal of the American Medical Association states. (Feb. 8.)

A young woman came to her doctor with a breaking out on the skin, which he traced to her use of lipstick. She had been using a certain brand for years with no ill effects until she changed shades.

By patch tests on the girl's arm, the physician found that she was sensitive not to the oil or dyes in the rouge, but only to the perfume used in two shades of lipstick of the brand she had been using.

The same test was made on thirty-eight other women. Exactly half of the thirty-eight were sensitive to the lipstick that had methyl heptine carbonate in its perfume. Other possible components of the perfume used in lipsticks gave no reaction.

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CONSERVATION

"Weed Trees" Needed To Make Wildlife Thrive

WILD birds and game animals will come back in larger numbers, and thrive better, if all our forests are not kept "perfect" from the timber-producing point of view, W. L. McAtee of the U. S. Department of Agriculture told the North American Wildlife Conference at its Washington meeting.

To produce the most board feet per acre, forests are grown exclusively of one species, usually of conifers like pine or spruce. All other trees, like beech, oak, maple, wild cherry, sourwood, persimmon, are ruthlessly eradicated as "weed trees," just as a farmer will consider goldenrod and wild sunflower as weeds to be plowed out if he finds them in his cornfield. Trees grown in this way lace their tops together in a closed canopy, which again is desirable for growing timber.

But such a forest has a bare floor, with no place for birds and game animals to hide themselves and their young from hungry enemies. The trees yield no food they can eat, no brush grows on the deep-shaded ground, and the friendly "weed trees," with their beechnuts, acorns, and berries, are gone. So the lumberman's "perfect" forest becomes a biological desert.

Mr. McAtee stressed the point that in regions planned for maximum timber production the standard forestry practices should be followed, with full consciousness that wildlife will be diminished. This is just as legitimate as planting corn even though wildflowers and meadowlarks cannot live in the cornfield. But in forested areas where hunting, recreation, or wildlife conservation is an objective, weed trees and other game-favoring "messy" growths must be permitted.

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CHEMISTRY

Chandler Medal Awarded To Prof. W. F. Giauque

PROFESSOR William Francis Giauque of the University of California —the man who stimulated research which ultimately led to the Nobel Prize winning discovery of the heavy isotope of hydrogen and heavy water—is the 1935 winner of the Chandler Medal of Columbia University.

In an announcement by Columbia University Trustees, Prof. Giauque's experiments on the discovery of three varieties—or isotopes—of oxygen were cited as outstanding research instrumental in his selection for the award.

The award committee, consisting of Profs. Arthur W. Thomas, Arthur W. Hixson and Leo Baekeland, all of Columbia, commended the oxygen research for stimulating world-wide research on all of the lighter elements including hydrogen, nitrogen and carbon and ultimately led to the identification of a new isotope of hydrogen—deuterium, component of heavy water—by Prof. Harold C. Urey of Columbia.

Prof. Giauque's discovery that there were three kinds of oxygen instead of one, each with a different atomic weight was made with Prof. H. L. Johnson of Ohio State University.

Besides his oxygen isotope research, Prof. Giauque has contributed to knowledge of the theories concerning heat and entropy and especially made advances in the field of low-temperature studies near absolute zero.

Science News Letter, February 15, 1936

IN SCIE

ECOLOGY

Alfalfa-Like Weed Resists Both Drought and Cold

DROUGHT-threatened, as well as cold-stricken, areas are badly in need of a forage plant that can withstand wide ranges of temperatures.

After a long search a weed has been found by a group of Soviet scientists that not only satisfies this condition, but can serve also as good feed under ordinary conditions. It is known as sickle lucerne, and it grows in a large number of types on the steppes of the Ukraine.

This weed is remarkable in its endurance, can stand the longest, most devastating droughts, as well as the coldest snowless winters. It grows in sandy, clay, rocky, limy, and salty soils. It has a strongly developed fibrous root system running in all directions and making use of the slightest moisture in the soil. In this respect it is said to be far superior to alfalfa.

The food value of the sickle lucerne makes it a desirable feed plant. It contains 14.70 per cent. of nitrogen and 3.92 per cent. of fat.

Of all varieties of this weed the one growing on the island Biruchem in the Asov Sea is distinguished for its height. It grows to be nearly four feet high, which makes it easy for mowing by machine. The possibilities of cultivating sickle lucerne are being studied.

Science News Letter, February 15, 1936

ENGINEERING

German Pile Driver Operates by Explosions

NEWEST pile driver in use in Germany has an easily operated explosion cylinder instead of a heavy weight dropped from a high tower.

The device operates, in principle, like the explosion in an automobile engine. The expansion drives a piston down on the top of the pile. Although the device weighs 1,100 pounds, it is raised two feet by the recoil of each explosion. Two men are needed for its operation.

Science News Letter, February 15, 1936

E FIELDS

BOTANY

White Men Discover Indian Spinach

IT TURNS out now that Indians in Arizona eat an Indian sort of spinach. They have been eating it for years, and liking it.

The plant grows plentifully around Wupatki National Monument in the Hopi Indian country. Hopis prepare and eat it, just like white man's spinach.

Word received at National Park Service headquarters says that modern dwellers at Wupatki have tried their first mess of Indian spinach. The verdict sounds as if the Indians were "one up" on the white man on this spinach situation, for it is "similar to spinach, but without the sand."

Science News Letter, February 15, 1936

PHYSICS

Speaking Clock Developed By British Post Office

A SPEAKING clock used by the British Post Office department to tell time over the telephone was demonstrated at the Annual Exhibition of Scientific Apparatus, sponsored by the Physical Society and held at Imperial College of Science and Technology, in London.

The speaking clock announces the time automatically every ten seconds day and night with an accuracy of one tenth of a second. Each hour the system is checked against the astronomical clocks at Greenwich Observatory.

The telephone time announcements run: "At the third stroke it will be eleven seventeen and forty seconds." The spoken words are followed by three "peep" signals of 800 cycle tone, at one second intervals and lasting one tenth of a second.

Four glass disks, carrying sound tracks photographically recorded, make the announcement. One disk turning 60 times each minute carries records of the odd numbers 1 to 59, and a second disk the numbers 2 to 58, together with the word "o'clock."

A third disk speaks the hour and carries also the phrase "it will be." The fourth disk makes the preliminary announcement "At the third stroke" and adds the final part of the speech "and ten seconds."

Optical systems and photoelectric cells turn the disk records into electric current which operates the loud speaker.

Science News Letter, February 15, 1936

ENGINEERING

Robot Control Distributes Electric Power in South

ELECTRICAL robots, operating over telephone lines without destroying their ability to carry ordinary conversation, are being used to transfer, steady and control electric power loads through interlocked power systems of the South.

How power companies in Tennessee, Alabama, South Carolina and Georgia exchange power automatically by remote control stations as needed was described to the American Institute of Electrical Engineers by J. T. Logan of the Georgia Power Company of Atlanta.

The power-controlling signals going over the telephone lines of the company are in frequencies beyond the lines of audibility—higher than 20,000 cycles a second. The signals increase or withdraw power from the lines as the load varies throughout the day.

Mr. Logan gave a typical example to explain the operation of the system.

Suppose Tennessee wants 30,000 kilowatts of power from Georgia generating stations. The chief power dispatcher at Atlanta sets his power contacts at 28,000 kilowatts for a "raise" power order and 32,000 kilowatts for a "lower" power order.

As long as the power load from Tennessee remains between the 28,000 and 32,000 kilowatts, no control is needed. But if increased withdrawal of power in Tennessee drops the line load to below 28,000 kilowatts, the robot control sends the signal for more power to the Georgia generating plant, miles away.

If fewer Tennessee consumers are using power and the line load goes to the upper limit of 32,000 kilowatts, the same robots cuts the power being supplied to the line by the generators.

Formerly, said Mr. Logan, the company's telephone lines were used to transmit such information verbally and dispatchers changed the power loads manually. Fewer power interruptions and most constant line supply are advantages of the new method. Releasing the telephone lines for other use has already more than paid for installation.

Science News Letter, February 15, 1936

BIOLOGY

Fungi Thrive on Copper, Supposed to be Poisonous

COPPER is supposed to be deadly poison to molds and other fungi; but Clifford L. Bedford, of the University of California fruit products laboratory, has found one form that thrives in even a saturated solution of copper sulphate. It does not feed on the copper salt, but can absorb nourishment from several kinds of sugar as well as from starch in the presence of the strong copper solution.

Solutions of other copper compounds, as well as of salts of other heavy metals such as mercury, silver, cobalt and lead, were sometimes toxic to the fungus.

Science News Letter, February 15, 1936

BIOLOGY

Heavy Water Speeds Plant Growth, Slows Fungi

HEAVY water, with double-weight instead of ordinary single-weight hydrogen atoms, speeds the growth of ordinary green plants but slows the growth of non-green plants such as fungi. This discovery is announced by Prof. A. J. Ewart of Melbourne University.

In his experiments, bacteria and fungi were retarded in growth. Yeast was either not affected at all or was slightly accelerated, although it also is a non-green plant. Oat seedlings and other green plants grew faster.

Heavy water did retard green plants at one life stage: it slowed down germination of seeds. But once they were sprouted their growth was more rapid.

Science News Letter, February 15, 1936

ZOOLOGY

Lions Get Spotlight as Zoo Tries Floodlighting

LIGHTING up the lions with the latest floodlighting effects has been tried successfully at the Paris Zoo.

Using a complete switchboard with dimmers, the lion pit was lighted with red and yellow projectors, creating picturesque effects of the animals in their rocky den at night. The animals were protected against glare.

Seals have no more privacy than a goldfish with the new-fangled lighting. Their tank was flooded with powerful under-water lights to show their swimming antics.

Science News Letter, February 15, 1936

MEDICINE

Work Cures

Rest Cures for the Tired Business Man Went Out With The Depression, Now Opposite Method Aids Unemployed

By JANE STAFFORD

REST cures for the overworked business man or his wife who got tired out trying to find new ways to amuse herself went out with the depression.

Work-cures may be the order of the new day. They are seriously recommended as a remedy for unemployability by Dr. Bernard Fantus, professor of therapeutics at the University of Illinois College of Medicine and director of therapeutics at Cook County Hospital, Chicago. In fact, Dr. Fantus has already given prescriptions for work-cures to a number of patients and some of them have been sufficiently "cured" to join the ranks of the employed.

Unemployment is a problem for statesmen and economists who must find jobs for healthy men and women willing to work. Unemployability is a medical problem, Dr. Fantus contends, and it is up to the physicians of the country to treat the condition just as they would mend a broken arm or treat pneumonia, he says.

Unemployability may arise from injury or illness or from unemployment. In any case, the remedy, in Dr. Fantus' opinion, is work. For those who have suffered handicapping illness or injury, for the disabled veterans, patients suffering from heart disease or tuberculosis, the blind, deaf or crippled there are already in some localities special shops where they may learn to work and at least partially support themseves. But there are other unemployables who do not have these opportunities. Dr. Fantus is concerned about them.

Unemployment a Cause

Unemployment itself is the cause of some patients' illnesses, he points out, calling attention to the evil effects of unemployment "with all its grisly consequences of anxiety, sleeplessness, pessimism, and the exaggerated appreciation of the minor maladjustments of the bodily machine."

Even when it does not cause outright physical or mental disease, unemployment leads rapidly to unemployability. There is the case of the young engineer, college trained, who had been out of work so long that when a place was finally offered him he was almost afraid to take it.

"It is so long since I have done this kind of work, I don't believe I know how to do it now," he told one of his classmates.

You probably know of similar cases among your own friends or relatives, and they are multiplied many times in the experience of social workers. On this point Dr. Fantus observes:

"The gospel of the curative power of work is all the more necessary in these days when the deteriorating effect of unemployment on millions of our fellow citizens is daily becoming more evident: for there is as inevitable a tendency for the unemployed to become unemployable as there is for the unemployable to become unemployed."

Many Unemployable

Recently in a great city many persons applying for work relief were given a medical examination. As a result of this examination, it was found that over 18 per cent. of the applicants were unemployable.

"This means," says Dr. Fantus, "that unless some method be found of taking care of this army of unemployables, these persons will have to remain on a dole for an indefinite length of time, possibly for the rest of their natural existence, a burden to themselves, their families and the state."

He points out that these persons found unemployable had actually applied for work and that the percentage of the destitute who could be rescued by work-cures would be much greater if it also included those who consider themselves unemployable.

Dr. Fantus advises work-cures to keep the unemployed from becoming unemployable and he also advises them for all sick persons. He thinks work should be part of medical treatment, just as much as diet and rest and medicine.

"It is a fundamental axiom that human health and happiness require a harmonious balance of work and rest, of food and of fun; and this is just as true of the sick as of the well," he states.

Except in completely prostrating conditions, every sick person is able to work and is the better for work, providing the work is suitable for this individual, Dr. Fantus advises.

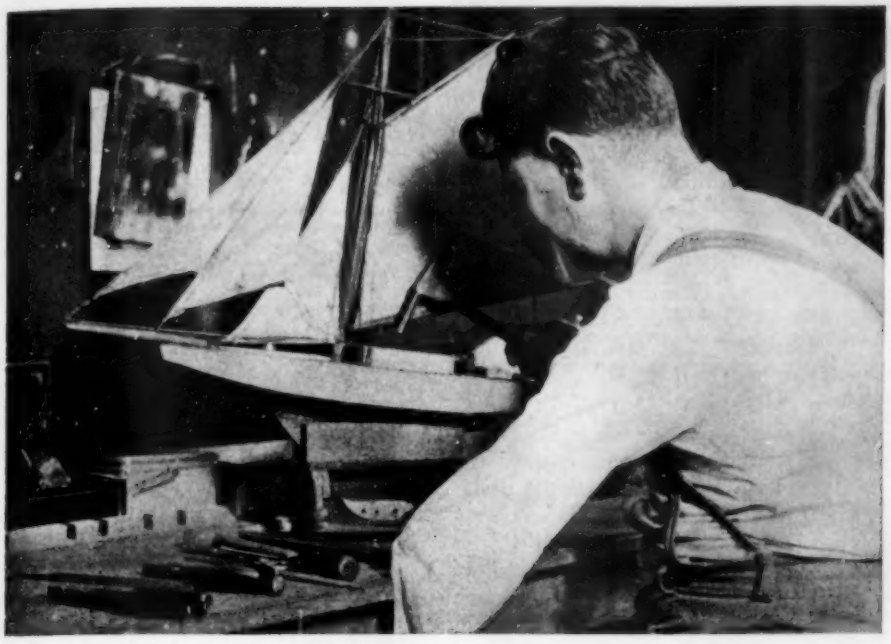
A Good Remedy

"There can be no doubt that work, properly prescribed and fitted to the disabled individual, is an even greater remedy than rest. For rest, unduly continued, weakens; work, properly graded, strengthens. Rest soon becomes intolerably boresome; and because of this is often abandoned prematurely. Work, properly prescribed, is an essential corrective to the evil tendencies and effects of rest. Rest treatment should be merely a preliminary to the more important portion of therapy: the refitting of the individual for work and for life.

"Up to the present, the medical profession has not measured up to the responsibility of returning to employability those who, for physical or psychic

TREATMENT

This convalescent patient is having physical therapy for an injured arm and a work-cure to remedy present unemployability.



REHABILITATION

The work-cure often starts in the toy department. Putting broken toys in order is the stimulus that revives the interest of many despondent unemployables, puts them back on the road to recovered health, morale and jobs.

reasons, have become unemployable," he declares. "The physician generally considers his work done and discharges his patients or is discharged by them as soon as or soon after they get out of bed, out of a splint, or no longer require other rest-compelling form of treatment."

This is all wrong, Dr. Fantus maintains. The doctor should be on the job, prescribing for and watching the patient until the latter is not only out of bed but back at work.

But even when the doctor recognizes that his patient needs work what can he do? In these days, when so many healthy and willing persons cannot find work, it is "hollow advice" to tell a sick person he needs work to make him well.

"Work Stores"

Work-cure establishments are the answer, as Dr. Fantus sees it. There are more than enough drug stores where prescriptions for medicine to treat disease can be filled, he points out, but at present we have no "work stores" where the physician can send his patient when work is the remedy to relieve the patient's illness.

Occupational therapy has been installed in some hospitals, to revive the patient's interest in life, to train injured muscles, joints and nerves back to useful activity. Occupational therapy, excellent as it may be, does not go far enough, in Dr. Fantus' opinion. At best, it gives diversion and exercise; it does not give a real work-cure. And unfortunately the curative help even of the diversion and exercise is denied many who most need it because occupational therapy is an expensive form of treatment.

Sheltered Work

In Chicago there is now one place where patients can be sent for work-cures. It probably is the only such place in the country. It is run by the Chicago branch of the Goodwill Industries, under the supervision of Dr. Fantus and four other Chicago physicians.

For a long time, of course, the Goodwill Industries, both in Chicago and elsewhere, have provided what is known as "sheltered work." Persons handicapped by physical defect or in some other way not able to find a place in the strenuous world of industry have been put to work by this organization, which collects old clothing, discarded toys and household equipment and repairs and sells them at minimum prices to those who cannot afford new things.

The Chicago branch, however, has lately been doing more than provide "sheltered work." It has actually been giving work-cures on a scientific basis. During 1934, 311 men and women were referred by eleven medical and social agencies for curative work treatment.

There are 150 different kinds of jobs at which such patients can be put to work and to "cure." The jobs vary from various kinds of clerical work to porter work, millinery, cabinet work, pottery, weaving, repair of mechanical appliances and cooking and dishwashing.

Each Job Analyzed

Each job has been analyzed by a physician as to its curative possibilities and liabilities. The kinds of movements and degree of effort involved have been tabulated. The chart shows whether the job is done standing, sitting or stooping; which muscles are used; whether joints are held stiff or bent, and if bent, at what angle; if it is a lifting job, the number of pounds to be raised is given and how often. The analysis shows the amount of vision needed to perform each job, and whether it can be done with a missing or useless finger, toe, arm or leg, and so on. The patients are examined and their work prescribed by a physician, who also checks their progress toward recovery and employability.

In this way the patient can be assigned to the kind of work that will do him most good. Heart disease patients, for instance, need work where there is little physical exertion. The man who did heavy manual labor and now cannot because he has lost the use of his legs must learn to use his hands for delicate operations. Stiffened fingers that were once used to grasp a shovel must be given dexterity to fit them for another task. Weaving has been found a good preliminary treatment in such a case.

The psychology of the patient and of the job are also taken into consideration. Many of the patients have lost all hope of ever working again, have become so discouraged they do not even want to work. For this reason they generally start their work-cure in the toy department.

Reviving Interest

Picture a despondent grown man out of a job and leading an invalid's life for months with no idea he will ever work again. He is put at a table covered with broken toys. He starts fussing with them, trying to make a mechanical toy "go" again, gluing heads or guns onto broken soldiers. It seems like play, not work, and he "doesn't mind" it, is even willing to come back the next day and go on with the repair job. Gradually his interest revives and he "graduates" to another job, perhaps repairing an electric toaster instead of a mechanical toy. In time he will have learned to like

work itself again, and if he has developed some skill at his new task, he may be fitted into a real job. He is a work-shop "cure."

An observation work room has been established where most of the incoming patients are put to work in order that definite information may be ascertained concerning the patient's physical ability, physical limitation, aptitudes, skill, attitude toward work and his work habits.

Some of the patients need to be encouraged to work by easy, simple jobs, explained Walter C. Loague, superintendent of the Goodwill Industries in Chicago. Others need the stimulus of a more interesting, exciting kind of work. So the jobs are classified on a psychological basis as easy, quiet, interesting, simple, slow, popular, stimulating rapid, involving repetition, and the like.

Another part of the work-cure is teaching patients to cooperate with their fellow workers and supervisors. Some of them have been ill or handicapped so long that they have never worked. They have been "babied" at home. They never had a chance to learn team play from athletic games. These learn during the work-cure to be punctual, to work whether they feel like it or not, to work willingly with others as part of a team.

The psychological part of the work-cure is very important, both Dr. Fantus and Mr. Loague pointed out. The patient's mental attitude may be far more serious than his physical defect as a handicap that makes him unemployable. On this point Mr. Loague says:

"Stabilizing neurotic persons is another service which the Goodwill Curative Work renders. These people are like a ship which is in danger of sinking because its cargo has listed to one side. If the cargo could only be more evenly distributed, the ship would regain its normal balance. Worry, fear, emotional stress and other factors are inclined to center a person's whole thinking around certain ideas. An unbalanced state of mind sometimes results. This condition takes the form of an over-excited nature, depression or forms of fear complexes. The assignment of the right kind of work can often bring about a mental balance by providing a needed diversion or thought, a stimulating factor, a sedative occupation, or just a regulated program of living."

This first work-cure shop is a start on the right road, an example of the sort of thing that can be done, under medical supervision, to remedy unemployability. Many more are needed, not only for the present when unemployment has made unemployability so much greater a problem, but for the future as a preventive of the condition.

The Social Security act has inspired Dr. Fantus with the hope that in the near future it may be possible to provide work-cures for all who need them.

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Science News Letter, February 15, 1936

Only in Ethiopia Are Found Gelada Baboons

See Front Cover

THE bizarre looking apes pictured on the front cover of this week's SCIENCE NEWS LETTER have homes only in the mountainous parts of Ethiopia. They have no counterpart anywhere else in the world.

The cover photograph shows a new group of these rare apes recently placed on exhibition at the Field Museum of Natural History.

Science News Letter, February 15, 1936

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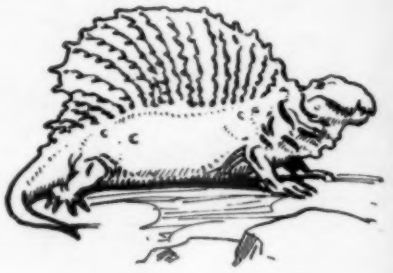
EVOLUTION

NATURE RAMBLINGS

by Frank Thone



The Survival of the Useless

ISN'T it odd, how long useless things survive!

In a world which is supposed to be governed, according to pure Darwinian doctrine, by ruthless competition, where only the fittest survive, there are really astonishing numbers of things that have nothing whatever to do with fitness, that even interfere seriously with fitness so far as human judgment can discern. And they last and last and last, most astoundingly.

Of what earthly use, for instance, are the endless arrays of spines and frills and ridges and other ornaments on reptiles? They don't fool or terrify their enemies: the creatures get eaten regardless. They don't help in catching the eye of a possible mate: males with lesser frills or spines manage to win the favor of females somehow. They don't help in getting food—if anything, they would seem in the way, if food-getting requires any agility, or ability to slip through narrow cracks. They're just there, without reasonably conjecturable use, and there they stay, an offense and a stumbling-block in the path of the curious, because we can't figure out a use for them.

The fashion is old, too. The weird saurians of the world's geologic Middle Ages, the "monstrous dragons of the prime that tare each other in their slime," were similarly decorated with exaggerated and useless appendages. Naturalists have racked their wits over them, and at the end have shaken their baffled heads.

Sometimes attempted explanations have run exactly counter to each other. In the days of the dinosaurs there was a fairly big reptile, not a dinosaur but of a somewhat higher order zoologi-

cally, that had a huge upstanding fin, like the fin of a modern sailfish, sticking up along its spine. Each of the long ribs that supported it had a row of thorny projections on either side. Altogether it was an awesome object.

What could have been the use of such an expanse of bone and skin? Some paleontologists have suggested that it discouraged bigger reptiles from biting the creature through its backbone. If that were the case, of course the structure had a real survival value. Others, taking the contrary view, have said that it was not a "fitness feature" but an "unfitness feature"—that its sheer size and awkwardness was a handicap that hastened the extinction of the species. But in spite of this handicap (if such it was) the reptile managed to survive many millions of years.

Now its mounted skeletons in the museums grin at us with bare teeth and empty eye-holes—a riddle still unsolved.

Science News Letter, February 15, 1936

PHYSICS

Noise Standard to Help in Choosing Hearing Aids

RELIABLE standards for the guidance of the 5,000,000 men and women who need mechanical aids to hearing will result from the work of a new committee of the American Standards Association.

Headed by Dr. Vern O. Knudsen of the University of California at Los Angeles, a group of manufacturers, specialists and users will develop national standards for measuring noise so that physicians and the deaf can select devices to aid hearing with scientific guidance.

Science News Letter, February 15, 1936

An expedition collecting fish on the Great Barrier Reef, off Australia, found tiger sharks 12 feet long.

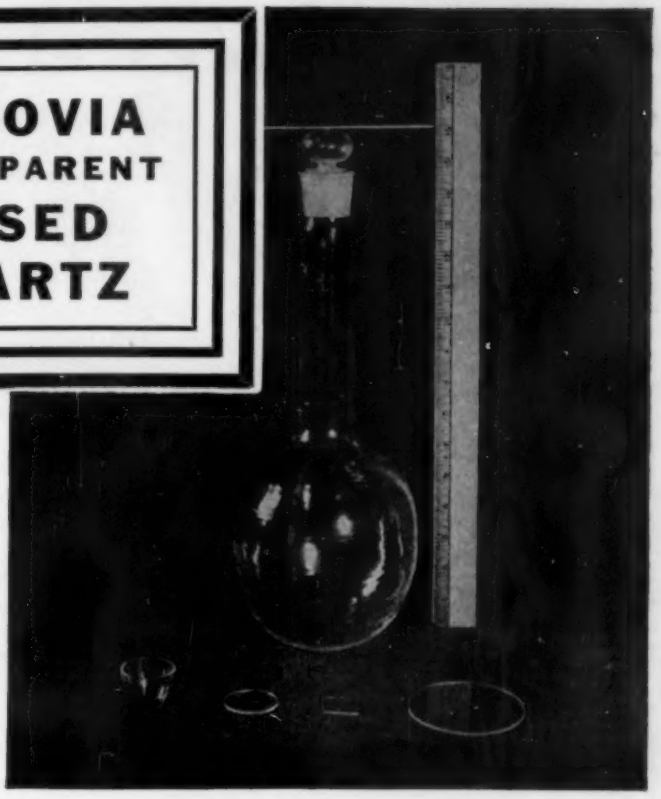
●RADIO

February 18, 3:00 p. m., E.S.T.
THE GEOGRAPHY OF DISEASE—Dr. Earl B. McKinley, Dean of the Medical School, George Washington University, Washington, D. C.

February 25, 3:15 p. m. E.S.T.
WEATHER — WHETHER OR NO — Dr. W. J. Humphreys of the United States Weather Bureau.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

HANOVIA TRANSPARENT FUSED QUARTZ



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•First Glances at New Books

Physics

THE RESTLESS UNIVERSE—Max Born—*Harper*, 278 p., $2.50. An outstanding "modern" physicist tries his hand at writing for the layman, with success. The intricacies of atomic and nuclear physics are described simply and pleasingly by the aid of simple examples, analogies and clever illustrations. Although a layman's book, it may be read with profit by a first-year graduate student to obtain the broad uncluttered picture of what physics is driving at in its new wave and quantum mechanics. The title comes from kinetic theory, not astronomy.

Science News Letter, February 15, 1936

Conservation

AMERICAN CONSERVATION — Ovid Butler, Ed.—*American Forestry Assn.*, 144 p., $2.50. A pictorial history of the struggling inceptions and the now mighty movement to place our forests, soil, wildlife, and mineral resources on a basis of use-without-destruction, told by one who has been active in the campaign since early days. The book will be welcomed by those who are already of the faith; and it is so attractively gotten up that it will attract the interest of many who are now indifferent and make converts of them.

Science News Letter, February 15, 1936

Bibliography

FIVE HUNDRED BOOKS FOR COLLEGE MEN AND WOMEN — C. D. Thorpe, Carlton F. Wella and T. Hornberger—*George Wahr*, 30 p., 25c. The whole field of science is dismissed with seventeen items; it might have been helpful to have listed at least one book on each science. Fiction classics are well covered.

Science News Letter, February 15, 1936

Juvenile

THE STORY BOOK OF WHEELS, SHIPS, TRAINS, AIRCRAFT — Maud and Miska Petersham — *Winston*, 128 p., $2.50. The romantic history of transportation, well told for children in simple but vivid style, with plenty of illustrations in color. In a time when children's books are steadily improving, this book still stands out.

Science News Letter, February 15, 1936

Public Safety

IF YOU'RE GOING TO DRIVE FAST—Ray W. Sherman—*Crowell*, 149 p. $1. Based on the thesis that current campaigns for safe driving are aimed at slow driving rather than good driving, the author gives some pointers which may be new to the latest crop of motorists. Speed, says the author, in itself is not dangerous; nor is slowness, in itself, safe. Without recommending faster driving, Mr. Sherman gives some straight-from-the-shoulder hints on how to travel fast and yet safely.

Science News Letter, February 15, 1936

Astronomy

CONSIDER THE HEAVENS—Forest R. Moulton — *Doubleday Doran*, 332 p., $3.50. Dr. Moulton knows his astronomy, he knows many of the bright passages in literature that have been lighted by the stars, and he has a command of a simple, vivid, popular style. His illustrations are as vivid and clean-cut as his textual presentation.

Science News Letter, February 15, 1936

Anatomy

THE MYOLOGY OF THE TRUNK REGION OF SNAKES AND ITS SIGNIFICANCE FOR OPHIDIAN TAXONOMY AND PHYLOGENY — Walter Mosauer — *Univ. of California Press*, 50c.

Science News Letter, February 15, 1936

Zoology

ELEPHANTS — W. W. Robinson, Drawings by Irene B. Robinson—*Harpers*, 43 p., $1.75. Mr. Robinson writes with vigor and discrimination on a topic that fascinates everybody; the drawings measure up to the text in every way. Prehistoric elephants, working elephants, war elephants, circus elephants—if you take up this book you will find it hard to put it down without finishing it.

Science News Letter, February 15, 1936

Biography

RENÉ BACHE, GREAT-GREAT-GREAT GRANDSON OF BENJAMIN FRANKLIN—Violet Biddle—*Dorrance & Co.*, 104 p., $1.50. Biography of the Washington popular science writer, son of the Coast and Geodetic Survey Bache.

Science News Letter, February 15, 1936

Bacteriology

THE BACTERIOLOGY OF TYPHOID, SALMONELLA, AND DYSENTERY INFECTIONS AND CARRIER STATES—Leon C. Havens—*Commonwealth Fund*, 158 p., $1.75. This book is chiefly of interest to bacteriologists and laboratory workers, but the chapter on chronic carriers may be of interest to epidemiologists as well.

Science News Letter, February 15, 1936

Biography

BIOGRAPHY OF PERCIVAL LOWELL—A. Lawrence Lowell—*Macmillan*, 212 p., $3. Probably no astronomer in modern times stirred up more vehement discussion than did Percival Lowell with his advocacy of the Martian "canal" theory. While astronomers are even farther from conversion now than they were in his time, they yet acknowledge their indebtedness to Lowell for his subsequent work on the planets, crowned posthumously by the discovery of the planet Pluto at the observatory he founded. These and many other facts in his active life are here told by his brother, former president of Harvard University.

Science News Letter, February 15, 1936

Astronomy

RESEARCH SURVEYS OF THE ORBITS AND PERTURBATIONS OF MINOR PLANETS 1 TO 1091 — A. O. Leuschner—*Univ. of Calif. Press*, 519 p., $4. (Contributions of the Berkeley Astronomical Dept., II). Notes and position tables on 1091 asteroids, of interest principally to working astronomers.

Science News Letter, February 15, 1936

Medicine

THE ROCKEFELLER FOUNDATION ANNUAL REPORT, 1934 — *Rockefeller Foundation*, 408 p., Free.

Science News Letter, February 15, 1936

Radiology

MANUAL OF RADIOLOGICAL TECHNIQUE—L. R. Sante—*Edwards Bros.*, 206 p., $4.50. A liberally illustrated manual for radiologists, X-ray technicians and physicians.

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Engineering

INDEX TO A. S. T. M STANDARDS AND TENTATIVE STANDARDS—*American Society for Testing Materials*, 159 p., Free by direct request to the Society Headquarters, 260 S. Broad Street, Philadelphia.

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Astronomy

HIGHLIGHTS OF ASTRONOMY—Walter Bartky; Photographs by Yerkes Observatory, Drawings by Chichi Lasley—*Univ. of Chicago Press*, 280 p., $2.50. STELLARSCOPE, for use with above book, $2. Clever and attractively-presented text book in elementary astronomy, designed for use in the University of Chicago's new Introductory General Course in the Physical Sciences. The Earth, Time, The

Sky, The Moon, Celestial Mechanics, The Solar System and the Sidereal Universe are the chapter headings. Discussion on the concepts of time are seldom found so clearly explained. Ingenious pen and ink drawings and diagrams provide illustrations that should intrigue any college freshman.

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Eugenics

TOMORROW'S CHILDREN, THE GOAL OF EUGENICS — Ellsworth Huntington —*Wiley*, 139 p., $1.25. Eugenics, heredity, birth control, sterilization, immigration, and standards of living are some of the topics included in this volume, which is written largely in question-and-answer style. The aim is to present "in simple but accurate language the main principles of eugenics and their application to social problems."

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Psychology

WORKBOOK IN PSYCHOLOGY—Carl Havelock Wedell — *Wiley*, 129 p., $1.25. A student's workbook to accompany "Psychology, a Factual Textbook" by Boring, Langfeld and Weld. Each lesson includes suggestions for study, notes and explanations, and exercises.

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Ornithology

THE MIGRATION OF NORTH AMERICAN BIRDS — Frederick C. Lincoln — *Govt. Print. Off.*, 72 p., 10c. A condensed but highly informative booklet that will have a wide range of uses. U. S. Dept. of Agriculture Circular No. 363.

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Medicine

HEALTHFUL LIVING—Harold S. Diehl —*Whittlesey House*, 354 p., $2.50. In simple, non-technical language, the author gives a wealth of information on health and how to maintain it. The subjects range from diet and exercise to mental health, sex, choosing a doctor and care of the teeth and eyes. The book might be read straight through or it might be kept on a special shelf for consultation as various health problems arise.

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Nature Study

FARM ANIMALS — James Gilchrist Lawson—*Rand McNally*, 64 p., 10c. WILD ANIMALS—James Gilchrist Lawson—*Rand McNally*, 64 p., 10c. A pair of small natural history books, illustrated with halftones.

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Medicine

THE PATIENT AND THE WEATHER, Vol. 1, Part 1—William F. Petersen—*Edwards Bros.*, 127 p., $3.75. The always interesting question of the effect of the weather on man's physical and mental health has long been propounded. Within recent years medical scientists have given renewed attention to it. The author of this book has approached the subject from a new point of view and presents the findings of his extensive studies in a series of volumes, of which this is the first. Medical and public health scientists will be interested in his findings and their implication of new methods of treating some of the still-baffling diseases, among them mental disorders, that cannot be pinned down to a "germ" and treated with a vaccine. Meteorologists, too, will find the studies interesting. The lay reader, although also interested, would probably find the volumes rather heavy going, as they were of course primarily written for scientists.

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General Science

UNSOLVED PROBLEMS OF SCIENCE——A. W. Haslett—*Macmillan*, 316 p., $2. People not specifically trained in science, or given only a dab-taste of it in a hurry somewhere along their path through school, are exposed to the temptation of believing it to be omniscient and infallible. Scientists of course know that not all the questions are answered yet—in fact, that hardly any of them are really satisfactorily answered yet; but it is a healthy thing to have a book like this, sticking to a sober scientific basis and abjuring all cheap de-bunking tricks, that points out the unanswered questions and their present respective likelihoods and unlikelihoods of finding answers.

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Soil Science

TRANSACTIONS OF THE THIRD INTERNATIONAL CONGRESS OF SOIL SCIENCE, OXFORD, ENG., 1935, VOL. I—*Thomas Murby & Co., London* 428 p. This volume consists of papers presented under the auspices of six commissions of the Congress, covering physics, chemistry, microbiology and other aspects of soil science.

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Paleontology

INVERTEBRATE PALEONTOLOGY — Wm. H. Twenhofel and Robert R. Shrock—*McGraw-Hill*, 511 p., $5. Solid with fact and logical scientific inference, well thought out and well arranged, this book will be highly useful to geologists in both laboratory and field. While it does not pretend to be a popularization of its subject, at least on the easy-reading level, it will hold fast the attention of the more serious reader who undertakes it, assuming a background of elementary zoology. And although the vertebrate paleontologist, with his dinosaurs and mammoths, has the easier time catching his audience, it is the invertebrate paleontologist who usually scores when a vexed problem of historical geology cries out for a critical index fossil.

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Astronomy

WORLDS WITHOUT END—H. Spencer Jones—*Macmillan*, 329 p., $3. The author is Astronomer Royal in Great Britain, so it is to be presumed he knows what he is talking about. That he can talk about it well, concisely and intelligibly will be discovered by the reader immediately he reads a paragraph or two. In a field that might at first glimpse seem rather crowded, it may be prophesied with confidence that this book will make its own place.

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Plant Physiology

AERIAL FERTILIZATION OF WHEAT PLANTS WITH CARBON-DIOXIDE GAS—Earl S. Johnston—*Smithsonian Institution*, 9 p., 6 plates, 15c. (See *SNL*, Jan. 25, p. 56.)

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Geology

ANNOTATED BIBLIOGRAPHY AND INDEX OF GEOLOGY AND WATER SUPPLY OF THE ISLAND OF OAHU, HAWAII—Norah D. Stearns—*U. S Geological Survey, Hawaii, Honolulu*, 74 p.

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Chemistry

PROCEEDINGS, Tomo IV — IXth International Congress of Pure and Applied Chemistry —*IX Congreso Internacional de Química Pura y Aplicada, Madrid, Spain*, 613 p.

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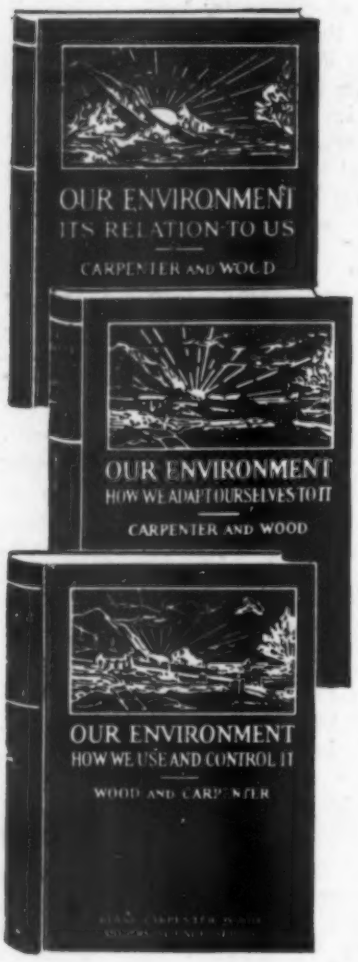
SOCIAL RESPONSIBILITY

"PHILOSOPHY begins in wonder" is as true today as when Plato used these words.

The wonders of science are a bridge to a true philosophy of life. Tested truths and scientific thinking produce these wonders. They produce also tolerance—the withholding of judgment until the facts are determined — distrust of all superstition and of all conclusions which are not based on carefully determined facts.



It is easy to understand why children begin first to wonder, then to think straight, then to develop a true philosophy which influences their conduct, when they study the simple laws and principles which have developed the railroad, the telephone, the radio which brings the whole world within earshot just by the turn of a knob, the airplane with which we cross the continent overnight.

What events in history are as important as the great scientific discoveries of the past made in the midst of religious intolerance and social unrest, occupying a much smaller place in history than this intolerance and unrest but outweighing both in importance and indeed contributing toward putting an end to both?

Four thousand children studying science selected the following as the ten most important results of science: electricity, radio, pasteurization, telephone, anesthetics, vaccination, medicine, X-ray, modern transportation, purification of water.

The study and investigation of these children has helped them to think straight. So, in ever-increasing measure, science contributes abundantly to right thinking and conduct. As our children share in its teachings, we may expect them to learn increasingly those principles of open-mindedness and unselfish service which will make them tolerant and responsible members of society.

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